THE HARMFUL EFFECTS OF NOISE

SOME little time ago we called attention editorially to the subject of noise, pointing out that the annoyance from this cause was becoming so serious that public attention was being drawn to it, in the hope that efficient measures of control might be devised. With the advances in civilization, accompanied as they are by the increased use of mechanical devices, noises of multifarious kinds have come into being and are increasing rapidly. Some of these noises are certainly unnecessary; many of them are probably unavoidable. With the increasing congestion of the cities we may expect the annoyance to become still greater, unless something is done about it. The problem is a difficult one, no doubt, but it is serious and demands solution.

Before proceeding to adopt the elaborate measures that would be necessary to control noise, it would be proper to enquire whether noise is harmful to the bodily organism. Most medical men would say that it is. Noise is distracting, nerve-racking, and, beyond question, it interferes with rest and sleep. But have we definite proof of all this? During the past few years attempts have been made, chiefly in American universities, such as Michigan, Northwestern, and Colgate, to substitute precision for generalities, and to that end numerous observations have been made with the aid of suitable instruments. The work up to date has been usefully summarized by Professor Donald A. Laird,* the Director of the Psychological Laboratory of Colgate University.

In order to get accurate standards for comparison, Professor Laird made use of an audiometer devised by the Bell Telephone Company. This instrument measures noise intensities on a scale ranging from 0 to 100, 0 being a just audible intensity and 100 an intensity sufficient to make the ear drum tingle to a degree just short of actual pain. It was found that there are few places where people work that are below an intensity of 50 units. In a shopping section in Chicago the intensity ranged from 50 to 70 or more, according to the time of day. Busses, automobiles, and taxis contribute about 50 noise units; surface and elevated cars, 60 to 65 units; subway trains, 75 to 80 noise units; in certain factories the operatives are subjected to 85 noise units. It was found that when a window was raised the noise within a room was increased by 40 per cent.

The harm that noises do, according to Professor Laird, does not appear to lie in any injury to the mechanism of the ear or to the auditory nerve, but rather that noises are effective in rousing the "fear-reaction." Common experience will illustrate this. All are familiar with the shiver, almost painful, that occurs when a file or caster squeaks; with the involuntary jump when a pistol is fired; with the fatigue after a noisy railway journey; with the fear during a thunderstorm. The fear-reaction in the cat is manifested by its hair standing up on end, a phenomenon due to the contraction of the minute arrectores pilorum. A similar muscular tonus occurs in the human subject, and the pulse rate, blood pressure, and the respirations may also be affected in the course of the fear-reaction. At the University of Michigan a sleeper was being studied. It was found that during the night when a taxi passed his window a rise in blood-pressure ensued, even though the sleeper did not awaken. Dr. John J. B. Morgan discovered that when stenographers were working under the influence of noise they exerted more pressure on the keys of their instruments. Here bodily energy was dissipated by a general tenseness of the muscles of the body. This is the exact reverse of relaxation; it is fatiguing and uses energy unnecessarily. Professor Laird also found that, in experiments on typists, when the noise in the test-room was reduced by only 15 per cent there was a 5 per cent increase in the output, and about 25 per cent less bodily energy was employed in doing the typing. It further developed that there is a critical point in the scale of noise intensities above which the fear-reaction and possibly other effects are made manifest. The present indications are that most city, office, and factory noises are above this critical point.

*LAIRD, D. A., *The Scientific American*, **84**: 508, Dec., 1928.

The noise problem can be attacked in two directions; by legislative enactment forbidding unnecessary noises; by improving machinery so as to reduce its noise coefficient; by diverting heavy traffic from residential sections; by developing suitable roads; this is the attack on the source; or, by employing devices to reduce the noise within buildings to an intensity below the critical point. In the case of the modern reinforced concrete building this will be difficult; in the case of the private house, not so difficult. Sound-absorbing material can be used in floors and walls; rugs, hangings, pictures, and furniture generally are found to prevent echoes and so deaden noise. Furthermore, experiment has shown that it is possible to construct ventilators to be attached to windows which will reflect and dissipate a large proportion of the street noises without interfering with the supply of fresh air. Good construction of buildings would do much to lessen the harmful effects of noise.

A.G.N.

ETHYLENE GAS AND MARKET GARDENING

ETHYLENE gas is being thought about and written about a great deal at the present time. It seems to be gaining in popularity as the anæsthetic of choice in certain classes of operations. But it is not generally known that it is also finding its place in the industrial world. It is being used to to hasten the ripening of fruits and vegetables. Celery may be whitened and oranges and tomatoes may be prematurely coloured by subjecting them to the action of this gas. This has an important economic bearing, since it now becomes possible to lengthen the season for such commodities and, by producing a natural appearance, to ensure their ready saleability.

The question, however, at once suggests itself whether the artificial ripening of fruits and vegetables may not interfere with their content in vitamins and thus lessen their food-value. The answer to this question will depend on the outcome of experimental tests. Something has been done already in this direction, but the full answer is not yet. The matter is so important that it has attracted the attention of the American Medical Association and has been referred to editorially in the Association's *Journal*.*

Working in the University of Maine, M. F. Babb† has endeavoured to elucidate the problem, so far, at least, as it applies to celery, in which case ethylene is used chiefly for blanching. He took young rats, paired as to weight, and belonging to the same litter, and fed them a diet devoid of Vitamin B. They developed the symptoms characteristic of Vitamin B deficiency. Then he fed them with known quantities, apart from the basal ration, of celery blanched with ethylene and that blanched naturally, keeping note of control animals in each case. His results showed that the artificial blanching of the celery did not impair its content of vitamin B.

A.G.N.

* *J. Am. M. Ass.* **89**: 792, Sept. 3, 1927; *Ibid.* **89**: 1875, Nov. 26, 1927.

† Science p. 231, Sept. 7, 1928.

SHOULD THE SIPPY REGIME FOR ULCER BE DISCARDED?

THE results of the medical treatment of gastric and duodenal ulceration are far from gratifying at the present time. Rest, hourly feeding, and alkalies alleviate symptoms in a majority of instances, but the percentage of permanent cures of even simple ulcers is not high. On this continent the Sippy and Lenhartz managements have been widely accepted, and one or other exists as the routine treatment of ulcer in many hospital units. In England, the value of these régimes has been questioned, and recently investigations carried out at Guy's Hospital by Dr. Arthur Hurst,* and his associates have gone far towards proving their weaknesses experimentally, and pointing out the means by which ideal conditions

* Recent Advances in the Treatment of Gastric Diseases, A. F. Hurst, *Brit. M. J.* **2**: Nov. 3, 1928.